



Colorado



OPERATIONAL ANALYSIS OF THE EMS DELIVERY SYSTEM

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Emergency Services Consulting International

Report Contents

- Organization & System Overview
- Operational & Administrative Staffing
- Financial Analysis
- Capital Facilities, Vehicles, & Equipment
- Service Delivery & Operational Performance
- Interfacility Transports
- Community Paramedicine Analysis
- Future Service-Delivery Options
- Recommended System Improvement Goals
- Appendices A–F

173 pages

125 figures



Organization & System Overview

- Summit County
- Summit County EMS Provider Organizations
- Air Ambulance Service
- Training Center
- Service Area
- Emergency Communications
- Medical Direction & Medical Control
- Hospitals & Clinical Facilities
- EMS Operations & Deployment



Financial Analysis

- Financial History
- Summit County Government
- Summit County Ambulance Financial Review
- Patient Billing & Collection Discussion
- Summit Fire & EMS Financial Review
- Red, White & Blue Fire District Financial Review
- Financial Summary
- Estimated Costs of EMS Transport



Financial Summary

Budgeted Combined Agency Revenue Resources (2018)

2018 Adopted Budget

Financial Resources	SCAS	SFE	RWB	TOTAL
Property Tax ¹			\$7,717,128	\$7,717,128
Specific Ownership Tax ¹			\$350,000	\$350,000
Safety First Tax ²	\$1,876,990			\$1,876,990
Interest/Investments	\$1,000	\$10,000	\$67,600	\$78,600
Transfers ³		\$9,478,221		\$9,478,221
Ambulance Fees ⁴	\$4,238,155			\$4,238,155
Other Fees	\$6,000	\$287,393	\$156,000	\$449,393
Contracts (other than SCAS)	\$25,000	\$126,279	\$294,525	\$445,804
Grants/Contributions	\$150,766		\$373,013	\$523,779
Miscellaneous/Other Revenues			\$22,198	\$22,198
Total Revenue:	\$6,297,911	\$9,901,893	\$8,980,464	\$25,180,268
Beginning Fund Balance ⁵	\$630,927	\$0	\$6,214,012	\$6,844,939
Total Resources:	\$6,928,838	\$9,901,893	\$15,194,476	\$32,025,207

¹Tax revenue not shown for SFE partner districts, which provide transfer to Authority but retain tax collection powers

²Safety First Tax collected by Summit County; a portion of which is shown & designated for support of ambulance service

³Transfers from SFE partner districts based upon proposed annual expenditures for fire and EMS

⁴Total ambulance fees anticipated prior to any contractual split with other agencies

⁵Beginning fund Balance for LDFD General/Capital Fund is \$6,991,138; CMFR General Fund is approximately \$715,000

Financial Summary

Budgeted Combined Agency Fire & EMS Expenditures (2018)

2018 Adopted Budget

Financial Resources	SCAS	SFE	RWB	TOTAL
Staff (salary/benefits)	\$3,095,756	\$7,976,213	\$6,667,337	\$17,739,306
Operating	\$1,354,418	\$1,502,009	\$2,057,540	\$4,913,967
Capital ¹	\$2,300,500	\$195,000	\$430,000	\$2,925,500
<i>Facilities</i>	\$1,883,130	\$0	\$160,000	\$2,043,130
<i>Equipment</i>	\$167,265	\$35,000	\$80,000	\$282,265
<i>Apparatus</i>	\$250,106	\$160,000	\$190,000	\$600,106
Debt Service	\$145,625	\$0	\$125,589	\$271,214
Total Expenditures:	\$6,896,299	\$9,673,222	\$9,280,466	\$25,849,987

¹Lake Dillon retains capital in fire district budget for 2018, rather than transferring to SFE, as did CMCMD; LD 2018 Facility budget is \$2,180,603; apparatus is \$265,000; & Equipment \$157,000

Financial Summary

Budgeted Combined Agency Revenue, Expense, & Net Impact (2018)

— 2018 Adopted Budgets —

Revenue/Expense	SCAS	SFE	RWB	TOTAL
Total Revenue	\$6,297,911	\$9,901,893	\$8,980,464	\$25,180,268
Total Expense (less facilities)	\$5,300,299	\$10,095,222	\$9,120,466	\$24,515,987
Net Gain(Loss)	\$997,612	-\$193,329	-\$140,002	\$664,281

Estimated Costs of EMS Transport

Results of Methods Used to Compare Costs of EMS Transport Services

Analysis Method	SCAS	RWB	Difference
Annual cost to operate a single full-time medic unit	\$955,321	\$996,057	+4%
Agency cost per individual transport	\$1,865	\$1,875	+0.5%

Service Delivery & Operational Performance

- Service Demand Study
- Distribution Study
- Response Reliability Study
- Performance Summary
- Patient Transport Analysis
- Patient Demographics & Characteristics
- Incident Data Discussion

Interfacility Transports



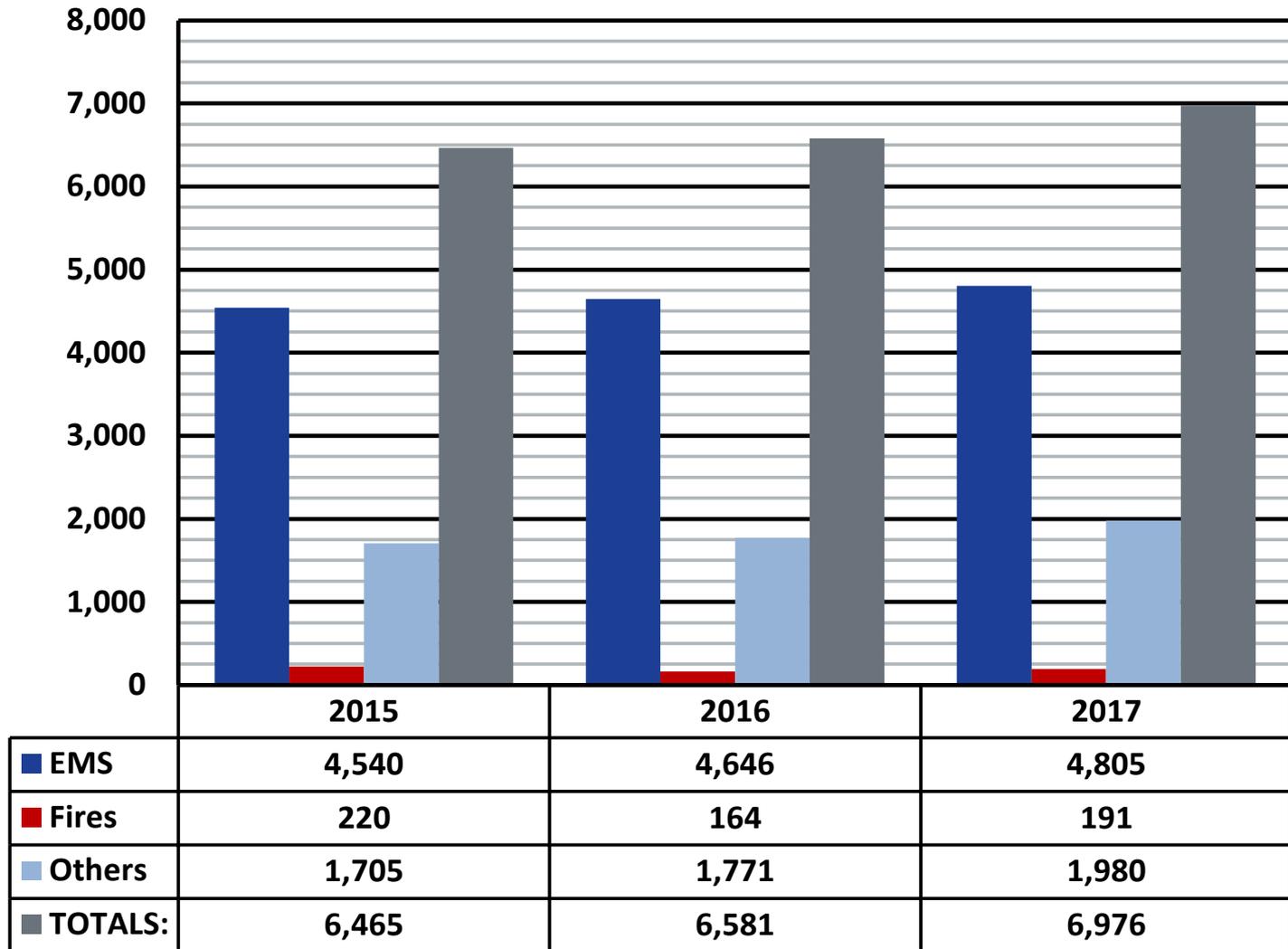
Challenges with Incident Data

- ESCI was provided with six separate datasets from five agencies and Summit County 911 (CAD).
- Hundreds of records required “cleaning” and manipulation in order to eliminate duplicate incidents and obvious outliers.
- Summit County 911 did not utilize a unique numbering system for each incident.
- Countywide incident data was calculated from CAD records.
 - Comparisons of countywide volumes do not necessarily equal the numbers from individual agencies.
 - For example, there may have been 100 individual MVAs in which both SFE and SCAS responded.
 - Agency records combined would equal 200 MVAs.
 - This issue may have been resolved with the upgraded CAD system.
- Regardless, ESCI believes the results are fairly accurate.

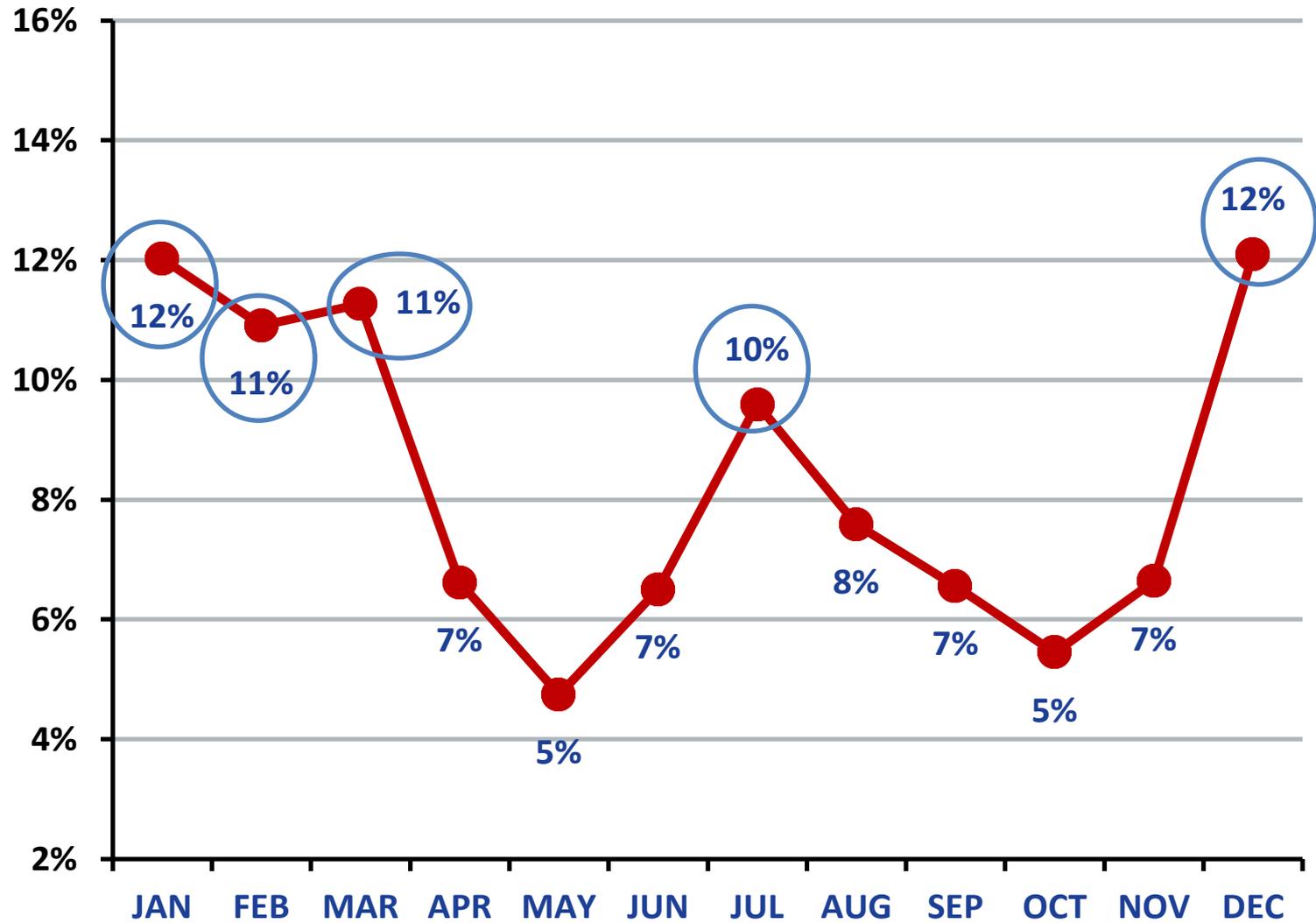


Summit County Service-Demand—All Agencies

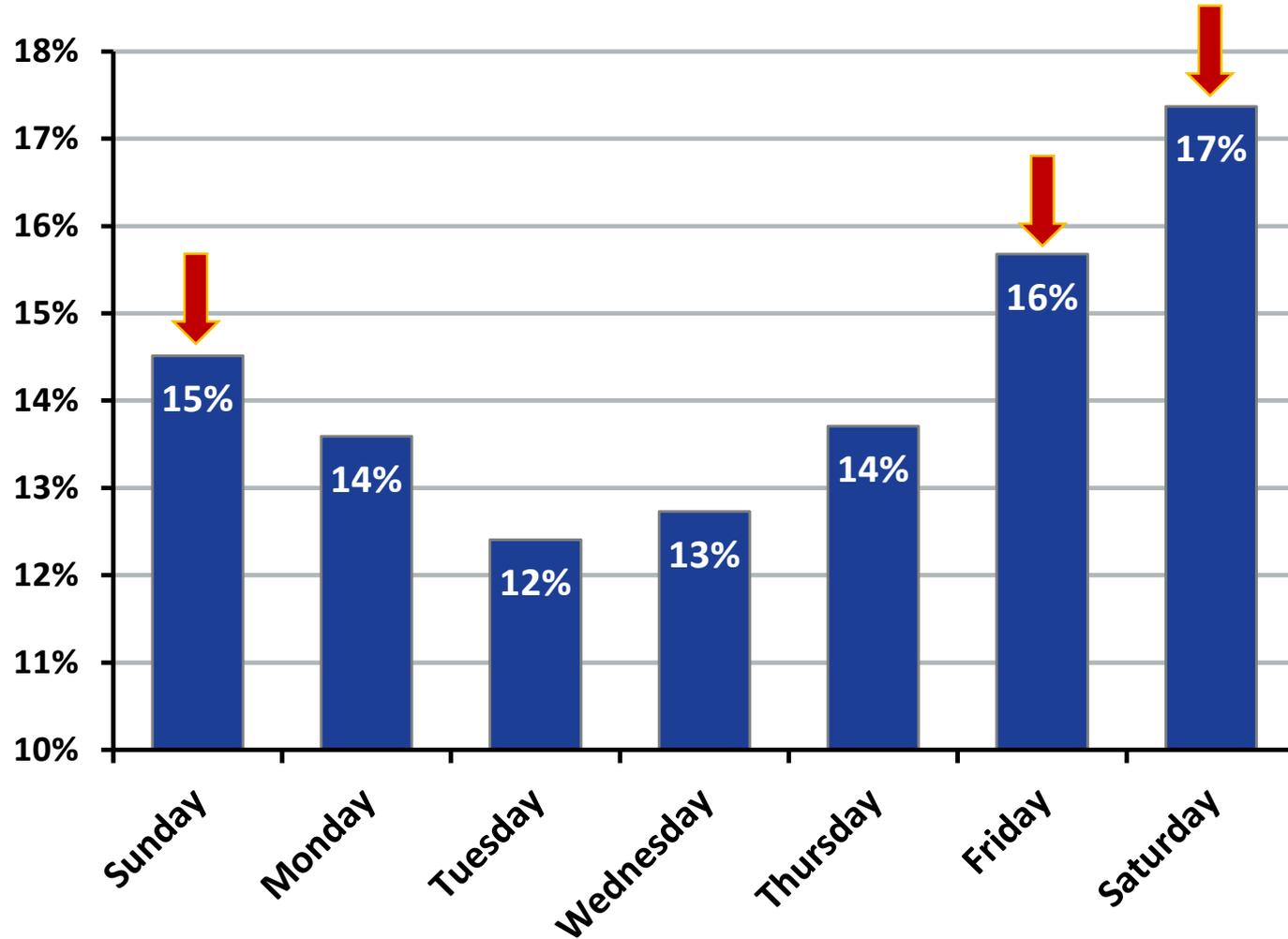
Source: CAD records



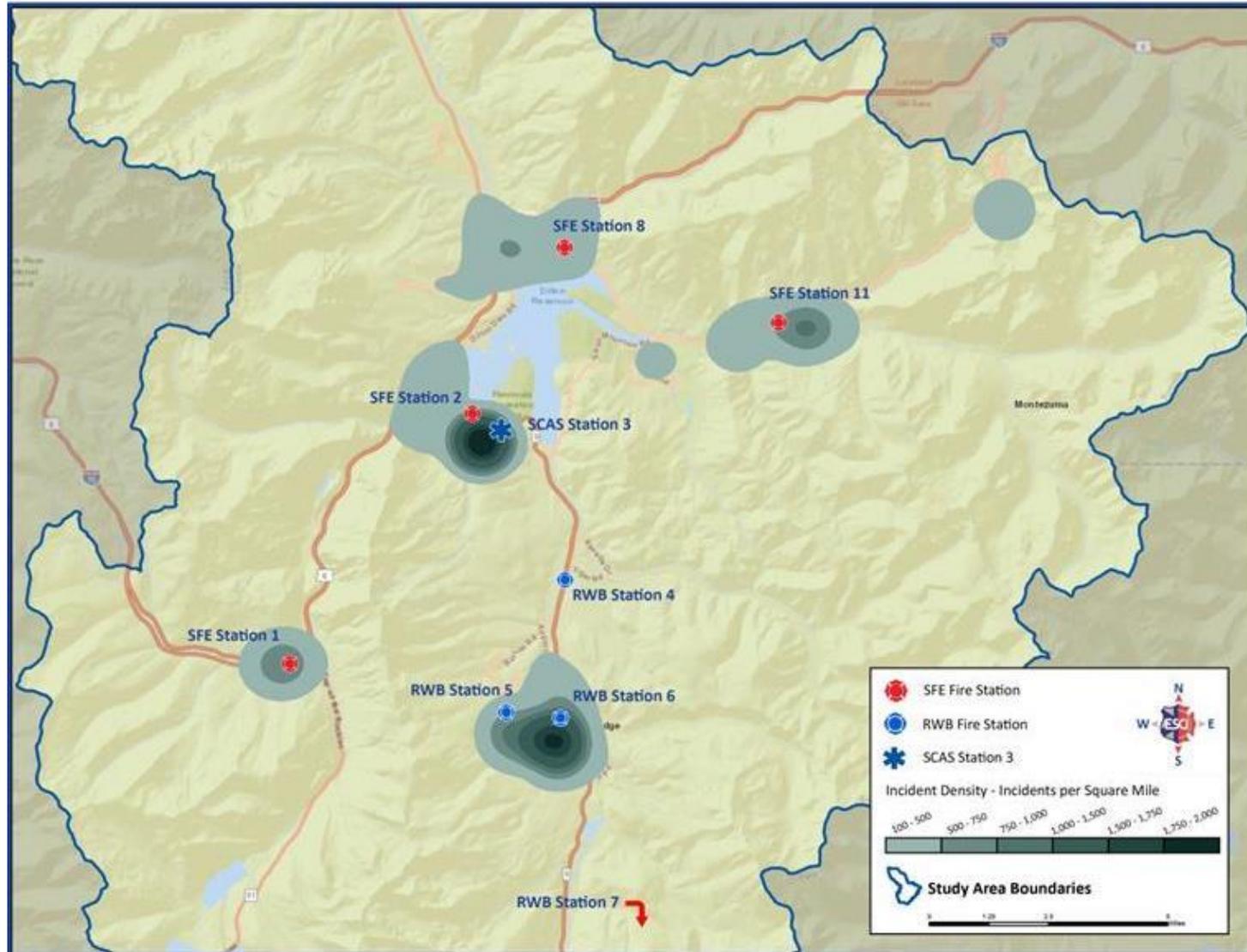
Overall Summit County Call-Frequency by Month (2015–2017)



Summit County Call-Frequency by Day-of-Week (2015–2017)



EMS Incident Density in Summit County (2015–2017)



Medic Unit Service-Demand (2015–2017)

Medic Unit	EMS	Other	TOTALS
Red, White & Blue Fire District			
Medic 5 ^A	93	12	105
Medic 6	2,251	11	2,262
Medic 7 ^B	39	0	39
Summit County Ambulance Service			
Medic 1 ^C	1,181	4	1,185
Medic 3	1,926	12	1,938
Medic 4 ^C	824	0	824
Medic 8	2,161	6	2,167
Medic 11	1,580	3	1,583

^AMedic 5 was not placed into service until October 14, 2017

^BCross-staffed as needed

^CPeak-demand unit; 12-hour shift

Concurrent Incidents (2015–2017)

Concurrent 911 EMS Incidents

Concurrent Incidents	Percent
Single Incident	37.3%
Two Incidents	30.0%
Three Incidents	17.6%
Four or more	15.1%

Two or more EMS incidents occurred simultaneously 62.7% of the time...

Concurrent OOC Transports

Concurrent Incidents	Percent
Single Incident	58.5%
Two Incidents	29.1%
Three Incidents	10.0%
Four or more	2.4%

Two or more out-of-county IFTs occurred simultaneously 41.5% of the time...

Performance Summary

Summit County 911—Incident Call-Processing Times

Year	90 th Percentile	Average Time
2015	03:46	01:50
2016	03:25	01:35
2017	03:21	01:31

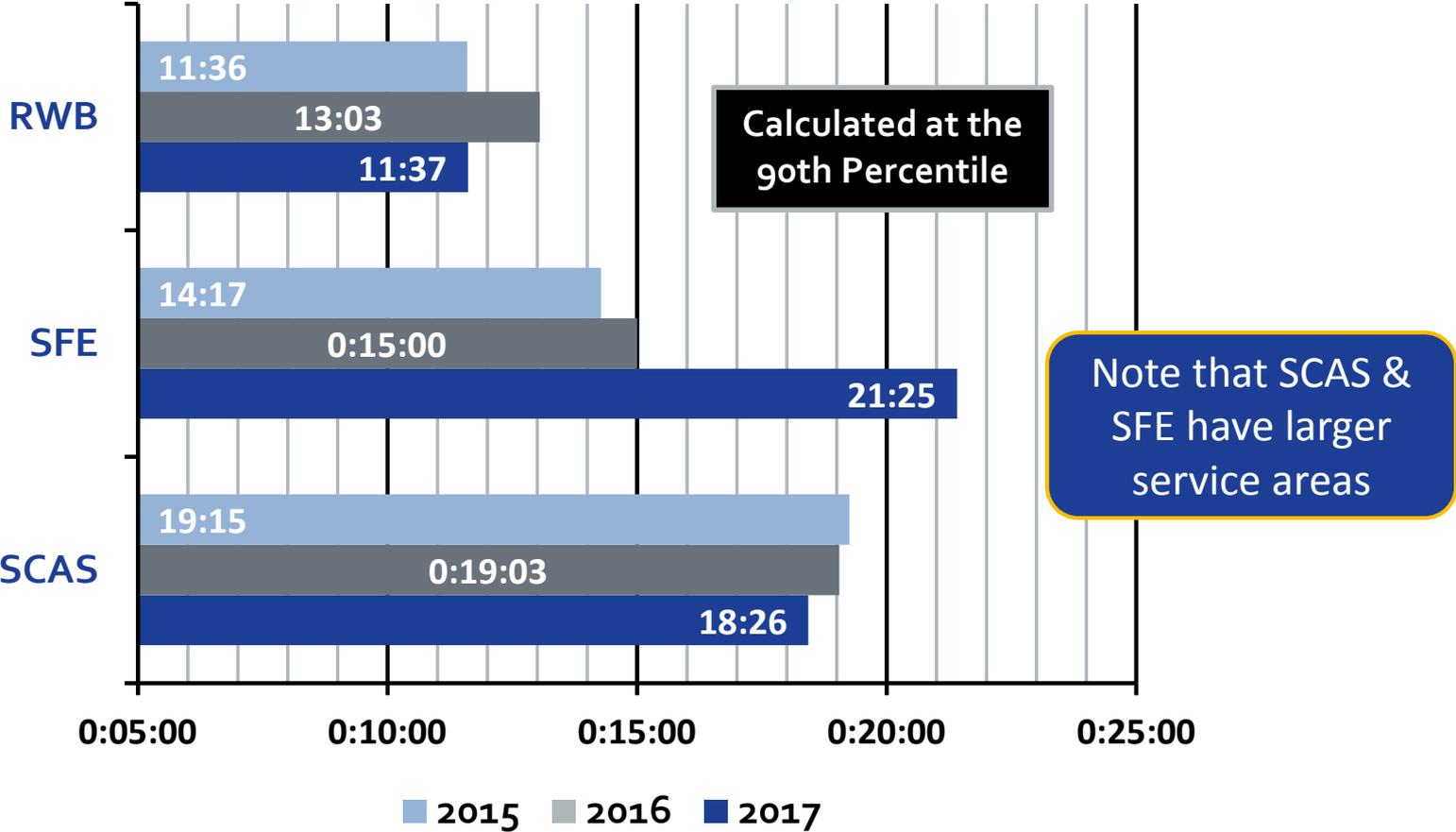
Medic-Unit Turnout Times at the 90th Percentile (2015–2017)

Agency	2015	2016	2017
Summit Fire & EMS	03:36	03:18	03:34
Red, White & Blue Fire District	03:18	03:12	02:56
Summit County Ambulance	04:22	03:38	03:19



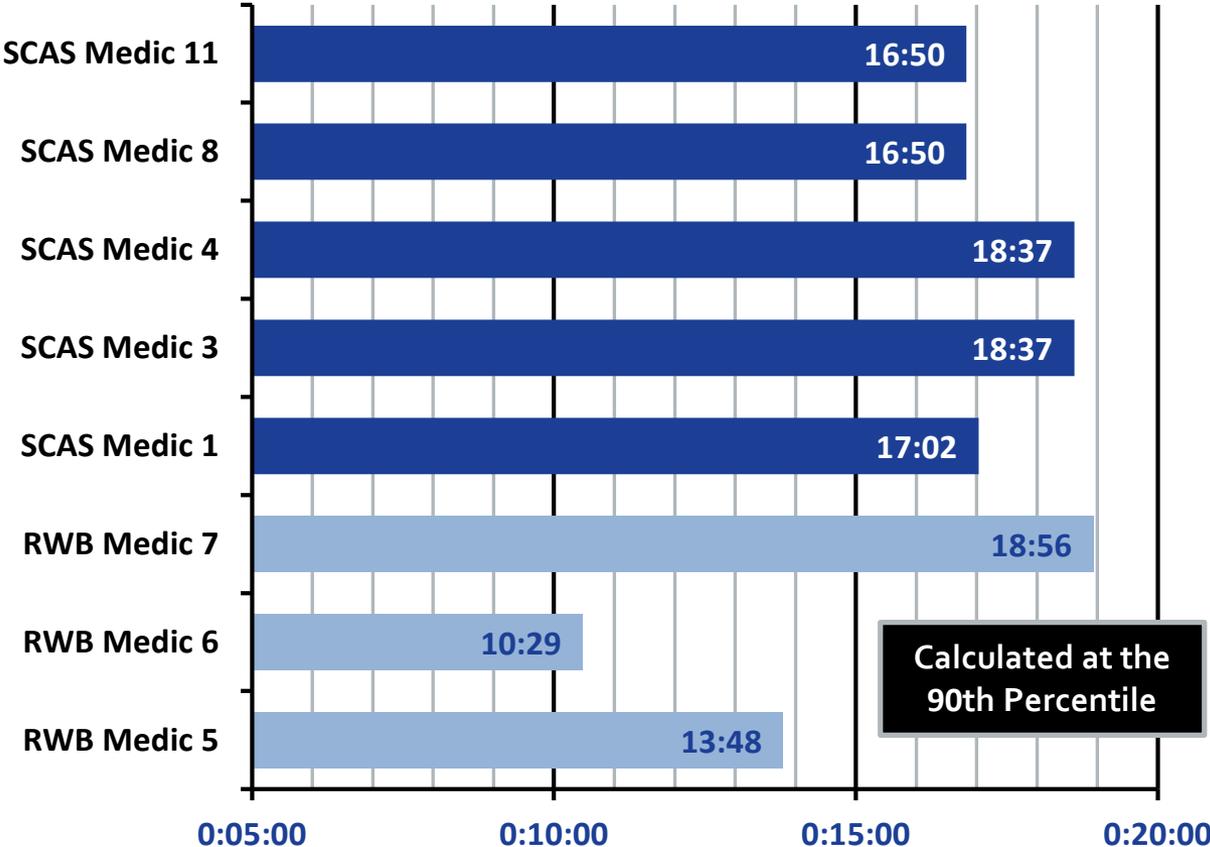
Performance Summary *continued...*

EMS Incident Total Response Times by Agency



Performance Summary *continued...*

Medic Unit Response-Time Performance (2015–2017)



Patient Transport Analysis

Patient Transports in Summit County (2015–2017)

Transport Provider	EMS Calls Dispatched	Patients Transported	Percent Transported
Summit County Ambulance	7,824	6,350	81.2%
Red, White & Blue Fire District	2,430	1,864	76.7%
Totals:	10,254	8,214	80.1%



Patient Transport Analysis *continued...*

In-County Patient Transport & Hospital Turnaround Times (2015–2017)

Transport Provider	Patient Transport Times		Hospital Turnaround Times	
	Average	90%	Average	90%
SCAS	0:19:19	0:28:50	0:20:11	0:31:34
RWB	0:18:35	0:24:47	0:09:53	0:28:23
Totals:	0:19:06	0:28:02	0:20:07	0:30:21

Out-of-County Patient Transport & Return-to-Service Times (2015–2017)

Transport Provider	Patient Transport Times		Return-to-Service Times	
	Average	90%	Average	90%
SCAS	1:28:54	2:03:51	1:58:42	2:59:43
RWB	1:46:18	2:20:00	1:54:43	2:34:20
Totals:	1:29:17	2:05:19	1:58:37	2:58:50



Patient Transport Analysis *continued...*

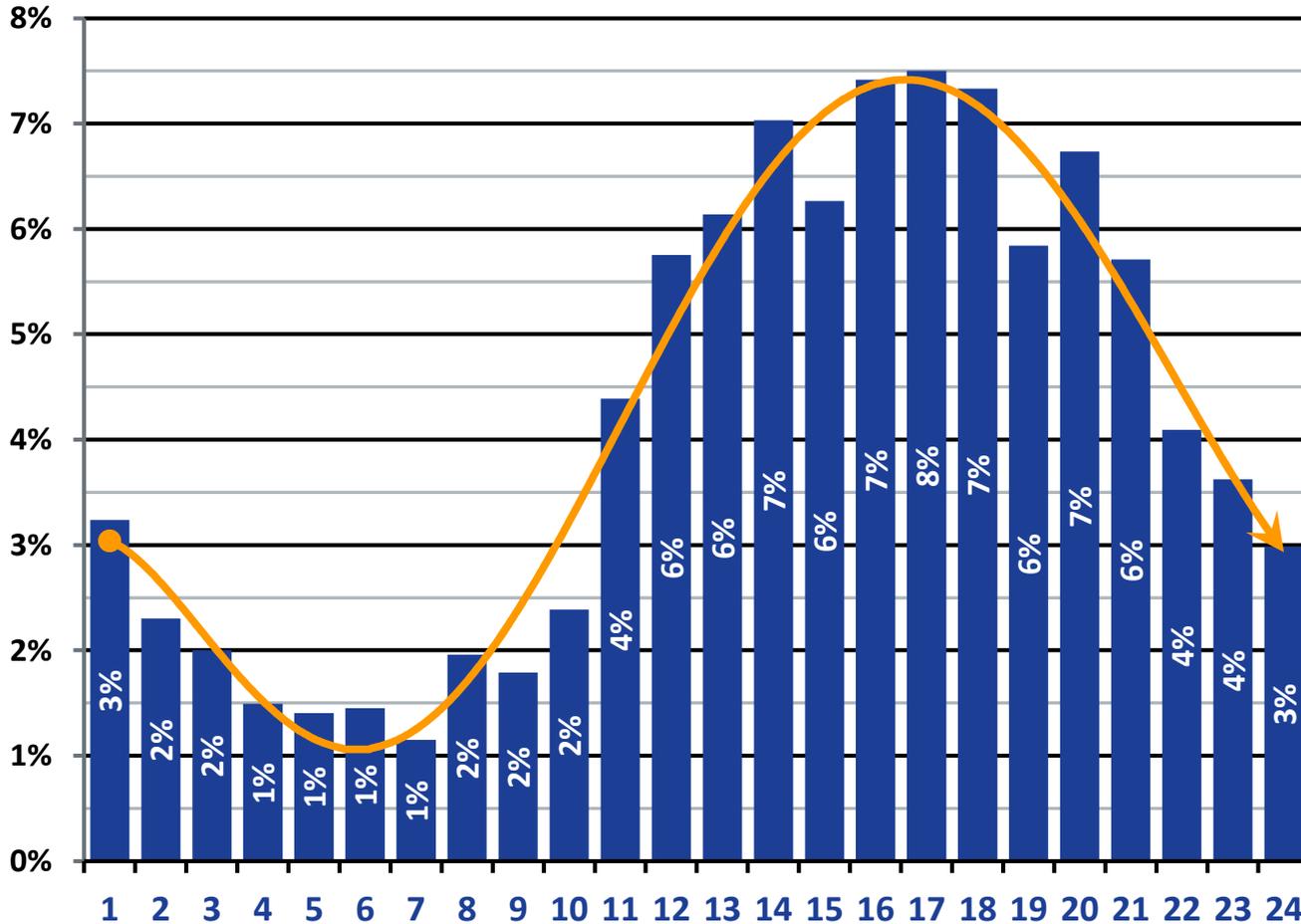
Time Commitment on OOC Transports by Medic Unit (2015–2017)

Medic Unit	Total Time	Average/IFT
Red, White & Blue Fire District		
Medic 5	N/A	N/A
Medic 6	200:39:02	3:27:34
Medic 7	N/A	N/A
RWB Subtotals:	200:39:02	3:27:34
Summit County Ambulance Service		
Medic 1	1723:26:03	4:01:36
Medic 3	2167:45:33	3:43:52
Medic 4	1573:06:04	4:02:01
Medic 8	1809:37:54	4:02:22
Medic 11	1780:50:42	4:06:46
SCAS Subtotals:	9054:46:15	3:58:17
Grand Totals:	9255:25:17	3:57:31



Patient Transport Analysis *continued...*

Hourly Service-Demand of Out-of-County IFTs (2015–2017)



Interfacility Transports

Estimated Financial Impact on Revenue with Reduced IFTs

IFT Transports Revenue	OOC Transports ¹		IC Transports	
Average Annual Cash Collected ²	\$1,402,917		\$553,430	
Percent Reduced	Reduction	Revenue	Reduction	Revenue
Cash collected if reduced by 25%	-\$350,729	\$1,052,188	-\$138,357	\$415,073
Cash collected if reduced by 50%	-\$701,458	\$701,458	-\$276,715	\$276,715
Cash collected if reduced by 75%	-\$1,052,188	\$350,729	-\$415,073	\$138,357

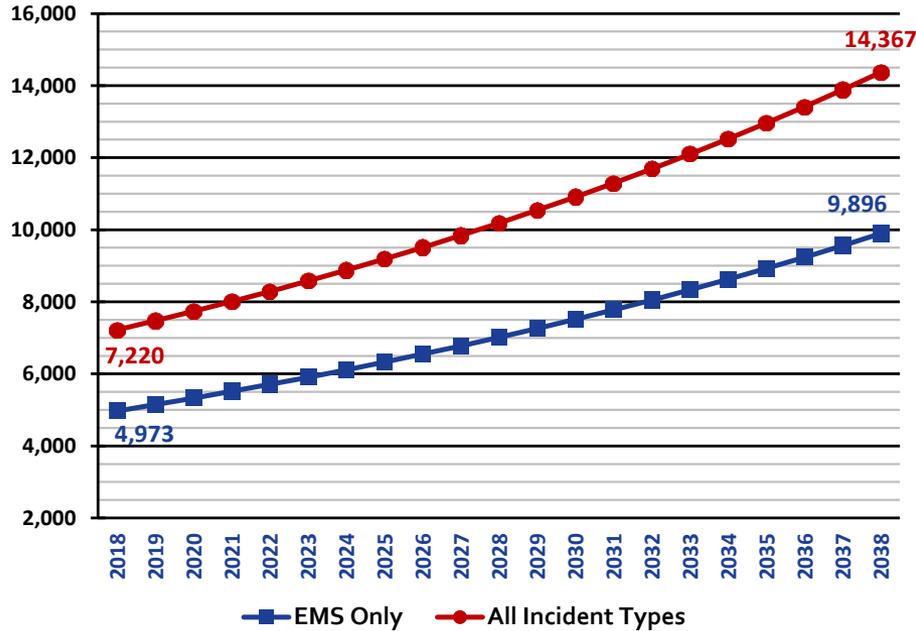
¹Excludes Terra Two OOC transports

²Annual average between 2015 through 2017



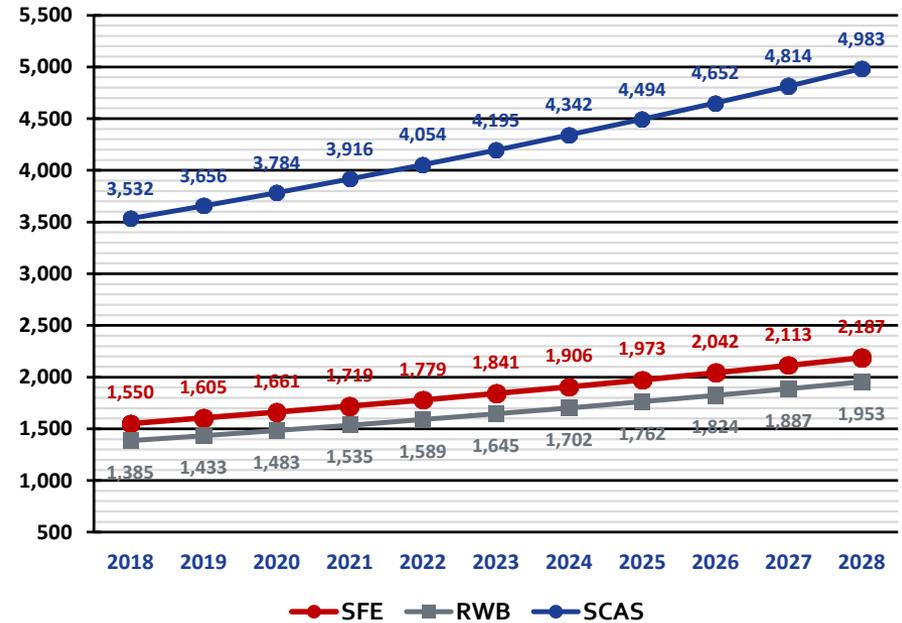
Projected Future Service-Demand

Projected Future Service-Demand in Summit County



Conservative forecasts... may be higher, as Colorado Demographer projects higher population growth than U.S. Census Bureau

Projected Future EMS Service-Demand by Agency



Community Paramedicine

- Data provided to ESCI was insufficient to definitively determine the need for a MIH-CP program.
- Multipage discussion about Community Paramedicine.
- ESCI recommends that Summit County *not* consider an MIH-CP program in the short term.
- Should re-evaluate once the other issues and system changes have been addressed.





Future Service-Delivery Options in Summit County



Option A: SFE/SCAS Consolidation

- Summit County government discontinues its *direct role* in the delivery of EMS, and transfers all operations to SFE.
 - SFE would continue uninterrupted provision of ALS transport services.
 - Former SCAS employees would not see a reduction in salaries and benefits.
 - A new organizational structure is described in detail in “Appendix A.”
- Summit County government would grant SFE, RWB, and Terra Two an independent license to operate ambulance service in accordance with the current Summit County EMS regulations, a new County ordinance, and/or intergovernmental agreements.
- Each agency would be responsible for their organization’s patient billing and collections, and will retain 100% of the revenue they collect.



Role of Summit County

- Summit County government would modify its role and focus on providing EMS system oversight and regulatory compliance, rather than the direct provision of ambulance service.
- The community would be served better if Summit County is in a position to ensure that EMS provider organizations comply with reasonable regulations and/or performance standards.
- Summit County should consider creating a Citizen's EMS Advisory Committee to provide public input on the EMS system.

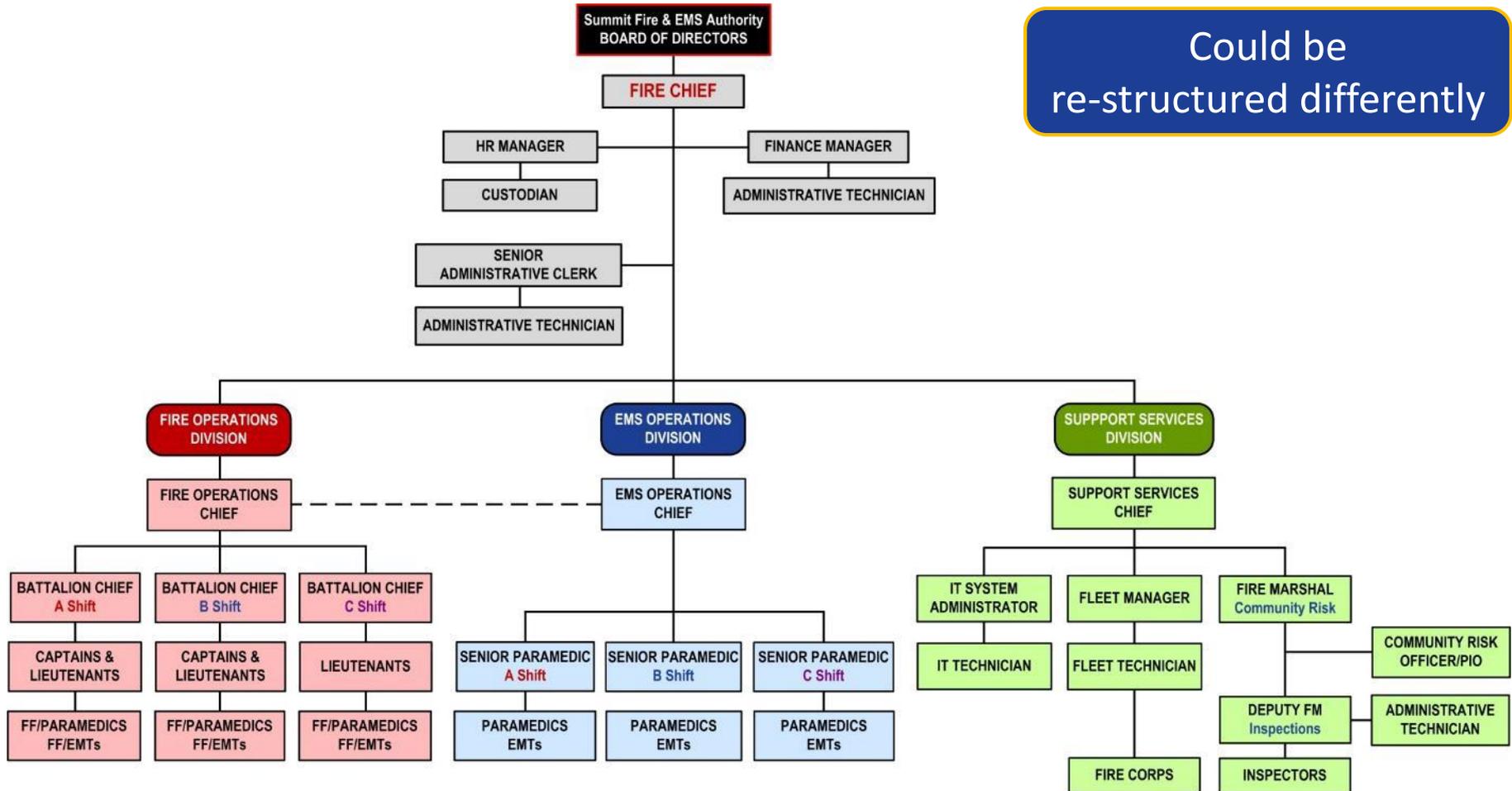


Role of Summit County *continued...*

- Colorado regulations grant Summit County the authority to issue licenses to operate ambulance service within the County.
- Options for the County to expand its regulatory role:
 - Consider modifying its current “EMS Rules & Regulations,” or adopting a new EMS ordinance or resolution requiring performance standards and other criteria for agencies requesting a license to operate.
 - An alternative to the options above could be IGAs with the individual emergency services organizations.
- Regardless of which option is selected, it should include performance criteria, minimum staffing requirements, equipment standards, and other elements to ensure quality assurance.
- *Appendix B: Denver EMS Regulations* can be used as a basis; but much more is needed.



Proposed SFE Organizational Chart with SCAS Integration



Could be re-structured differently

Recommended SCAS Position Assignments at SFE

Current SCAS Position	New Position at SFE
Director	EMS Operations Chief
Deputy Director	Training Chief ¹
Clinical Practice Manager	EMS Training Captain ¹
Office Manager	Senior Administrative Clerk
Administrative Clerk	Assigned to Finance Manager
Administrative Clerk	Assigned to Office Manager
Shift Supervisors	Senior Paramedics
Full-Time Paramedic IIs	Paramedic
Full-Time Paramedics	Same titles
Full-Time EMTs	Same titles

¹These positions to be assigned as employees of HCTC, jointly funded by RWB & SFE

ALL full-time SCAS employees would have a position at SFE or the HCTC



Option A: Financial Projections

Projected Revenues of a SFE/SCAS Merger

Revenue	2018 Budget	2019 Forecast	2020 Forecast	2021 Forecast	2022 Forecast	2023 Forecast
SFE Partner Transfers	\$9,478,221	\$10,941,136	\$11,454,759	\$11,992,842	\$12,556,564	\$13,147,160
SFE Other Revenues	\$577,672	\$589,225	\$601,010	\$613,030	\$625,291	\$637,797
Less SC payments	-\$144,000					
SCAS Cash Collections ¹	\$4,238,155	\$4,322,918	\$4,409,376	\$4,497,564	\$4,587,515	\$4,679,266
Less Other ²	-\$419,852	-\$856,498	-\$873,628	-\$891,101	-\$908,923	-\$927,101
Safety First Funds	\$1,876,990	\$1,933,300	\$1,991,299	\$2,051,038	\$2,112,569	\$0
Other SCAS Revenue	\$182,766	\$186,421	\$190,150	\$193,953	\$197,832	\$201,788
Total Revenue:	\$15,789,952	\$17,116,503	\$17,772,966	\$18,457,326	\$19,170,848	\$17,738,909

¹Forecast revenue includes the amounts from all Summit County transports combined

²Revenue from RWB and Terra Two transports escalates at same historical rate as total transport revenue



Option A: Financial Projections *continued...*

Projected Expenditures of a SFE/SCAS Merger

Expenditures	2018 Budget	2019 Forecast	2020 Forecast	2021 Forecast	2022 Forecast	2023 Forecast
SFE Annual Expenses ^{1,2}	\$9,478,222	\$10,941,136	\$11,454,759	\$11,992,842	\$12,556,564	\$13,147,160
SCAS Expenses ¹	\$5,349,799	\$4,605,426	\$4,810,124	\$5,024,424	\$5,248,785	\$5,483,686
Less Other ³	-\$563,852					
Less SC Admin. Fees	-\$376,429					
Total Expenditures:	\$13,887,740	\$15,546,562	\$16,264,883	\$17,017,266	\$17,805,349	\$18,630,846
Difference between Revenue & Expenditures						
Totals:	\$1,902,212	\$1,569,941	\$1,508,083	\$1,440,060	\$1,365,499	-\$891,936

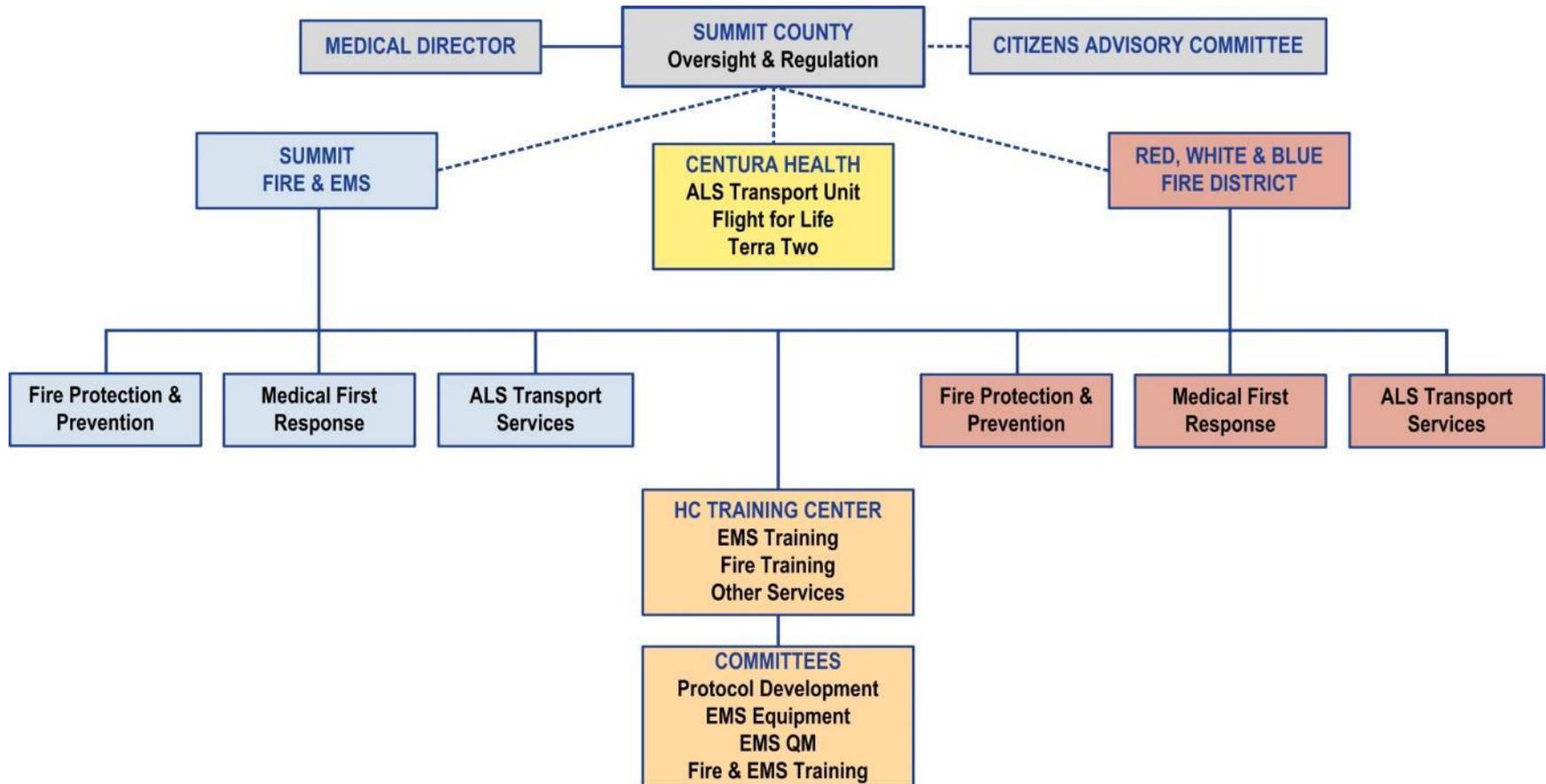
¹Excludes one-time capital expenditures, including SCAS contribution to joint administration building of \$1,600,000 in 2018

²Includes all expenditures necessary for fire/EMS operations and administration

³Payments to SFE, RWB, & Terra Two



Proposed Summit County EMS System Organizational Structure

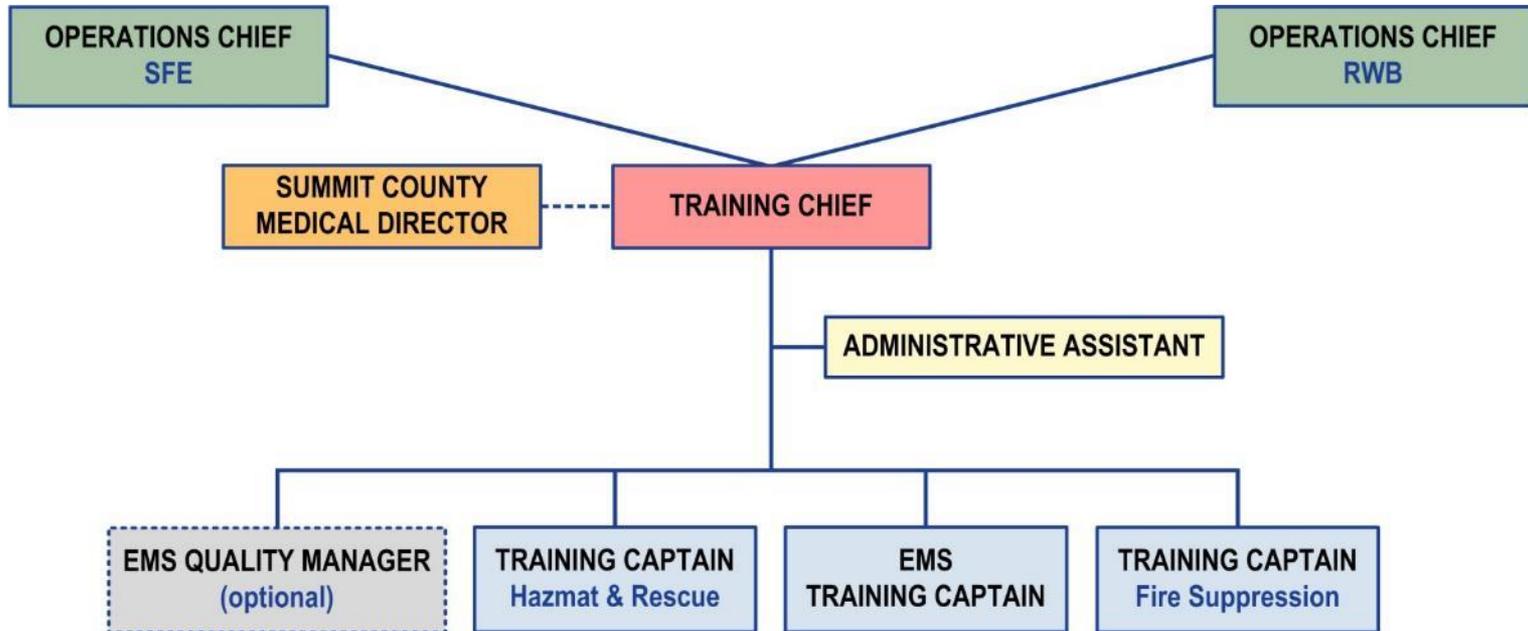


Option A: Regulatory Components

- Response Time Requirements
- Reporting Requirements
- Compliance Provisions (with CMS; HIPAA)
- Medic Unit Staffing & Scheduling
- Penalties for Compliance Failures
- Patient Charges & Fees
- Observations & Inspections
- Material Breach or Failure to Comply
- Emergency Takeover
 - Performance Bond



Proposed HCTC Organizational Chart following SFE/SCAS Merger



Jointly funded by
SFE & RWB

Option B: Status Quo

- The current infrastructures and operations of the existing Summit County provider agencies would remain the same: SCAS, SFE, RWB, and FFL/T2.
- Summit County government would issue an independent license to operate ambulance service to RWB and Terra Two; each of whom would operate in accordance with a County ordinance or intergovernmental agreements.
- Each agency would be responsible for their organization's patient billing and collections, and would retain 100% of the revenue they collect.
- SCAS and RWB would continue to share the responsibility for out-of-county transports, but would have to determine an equitable arrangement.
- OOC transports could be reduced, depending on Centura Health's willingness to establish an ALS ground transport unit(s) in Summit County (discussed later in the report).





ESCI recommends:
OPTION A



OOC Transports by Centura Health

- Centura Health has expressed an interest in adding one or more ALS units to conduct a *portion* of the OOC transports.
- Estimated revenue required to staff one medic unit:
 - Option 1—24-hours, year-round: **\$819,465 (about 471 transports)**
 - Option 2—24-hours, four months per year: **\$272,625 (157 transports)**
- RWB and SFE (or SCAS) would need to continue providing OOC transports.
- Questions that would need to be answered:
 - What amount of potential OOC IFT revenue reduction are the local agencies capable or willing to tolerate in order to reduce the frequency of these?
 - What is the preferred schedule? Year-round, four months per year, or other configuration?
 - When the Centura Health unit is unavailable, what would be a fair and equitable method for rotating OOC IFTs between RWB and SFE (or SCAS)?
 - Will need to develop a dispatch policy and procedure for OOC IFTs.



OOO Transports by Centura Health *cont'd...*

Alternative to a 24-Hour Schedule

- Staff an ALS transport unit on a 12-hour basis from 1000–2200 hours (10 am–10 pm), as historical data indicated the majority of OOC IFTs occurred during this time.
- In this model, a second unit could be scheduled during the same 12-hour period.
 - Would need further analysis to determine the impact on salaries and benefits of staff scheduled for 12-hour versus 24-hour shifts.



SWOT Summary

- **Interagency Relationships**
 - Majority of stakeholders commented that interagency relationships were either a weakness or threat.
 - Appeared to have some impact on employee morale.
 - Concern that the quality of service and patient care may decline due to the inability of agencies to compromise and work cooperatively.
- **Personnel & Staffing**
 - Concern about loss of employees to other agencies paying more.
 - Sleep deprivation and workload.
 - SCAS employees concerned about “takeover” by SFE.
- **EMS Operations**
 - Overwhelming issue was the considerable number of OOC IFTs.
 - Most agreed OOC IFTs contributed to a negative work environment.
 - Some believed the IFTs led to a greater depth of experience & skills



SWOT Summary *continued...*

- **Miscellaneous Issues**

- Pursue countywide consolidation of all emergency services organizations into a single agency.
- Potential loss of future revenue due to a variety of Colorado laws and other regulations.
- Lack of public information, education, and community outreach; including a Public Information Officer within some of the agencies.
- Ongoing problems with information technology and records management software.
- Limited preventative maintenance of apparatus; limitations in regular apparatus maintenance.





Recommended System Improvement Goals



Short-Term Improvement Goals

- Improvement Goal A-1:
Medic Unit Deployment
- Improvement Goal A-2:
Medical Direction
- Improvement Goal A-3:
Patient Billing & Collections
- Improvement Goal A-4:
Establish Medic Unit Response-Time Goals
- Improvement Goal A-5:
Create an EMS Officer within each Fire District



Mid-Term Improvement Goals

- Improvement Goal B-1:
Emergency Communications & CAD Data
- Improvement Goal B-2:
Interagency Partnerships & Committees
- Improvement Goal B-3:
Utilize Patient Satisfaction Surveys



Long-Term Improvement Goals

- Improvement Goal C-1:
Pursue Accreditation & Other Standards
 - CAAS
 - IHI “Triple Aim Initiative
- Improvement Goal C-2:
Upgrade Data Collection & Records Management
- Improvement Goal C-3:
Modify Paramedic Staffing



Long-Term Improvement Goals *continued...*

- Improvement Goal C-4:
Promote a Countywide Culture of Trust & Transparency
- Improvement Goal C-5:
Pursue a Single Countywide Emergency Services Organization



Appendices

- Appendix A: Proposed Organizational Structure of SFE
- Appendix B: SWOT Summary
- Appendix C: Denver EMS Regulations
- Appendix D: Sample Patient Satisfaction Survey



Conclusion

- This report represents the third independent study of the Summit County EMS system by an outside consulting firm, since 2013.
- ESCI has approached this study from an unbiased perspective, and without any pre-conceived perceptions.
- Intent was to provide key stakeholders with realistic and valid recommendations to ultimately improve the delivery of EMS, and in a configuration that will produce long-term sustainability.
- ESCI found that the key stakeholders, leaders, and elected and appointed officials all have a desire to ensure what is best for Summit County citizens and visitors—although they may disagree on how to accomplish this.
- ESCI hopes this will be the last study.



Summit County

Colorado

QUESTIONS?

